Project for Introduction of Hybrid Power Generation System in the Pacific Island Countries

Project Overview

This project takes into account the status of Pacific Island countries' adoption of renewable energy sources in providing assistance for appropriately and economically operating and maintaining(O&M) diesel generators (DG) as well as adopting and operating renewable energy on an appropriate scale as part of an effort to promote the adoption of hybrid power generation systems employing both DG and renewables.

Project Term

March 2017～June 2022 (5 years)

JICA Expert Team

Okinawa Enetech, Okinawa Electric Power Company, SMAECO, Okidenkigyo, Okinawa Kobori Denki, and KD Tech

Target Country: Fiji

Overall Goal
To have Fiji and the Pacific Island Countries continuously utilize the know-how and technology necessary for hybrid power generation systems.

Project Goal
To enhance the regional training system for hybrid power generation systems.

Project Activities

Output 1 Preparation of a training program for a system that appropriately and economically implements DG O&M

1-1 Verify DG operational status
1-2 Evaluate competency of candidate trainers
1-3 Verify current relevant training activities and implementation framework
1-4 Conduct training for trainers
1-5 Prepare training guidelines, curriculum, schedule, and texts
1-6 Prepare necessary training equipment
1-7 Implement training program
1-8 Reflect lessons gained from evaluations in revised program
1-9 Prepare future training program including necessary budget after project completion
1-10 Disseminate appropriate and economical knowledge about DG O&M among relevant personnel

Output 2 Preparation of appropriate renewable energy plan and O&M method training program

2-1 Verify current status of renewables and introduction plan
2-2 Verify operational status of current renewable energy facilities
2-3 Evaluate competency of candidate trainers
2-4 Verify current relevant training activities and implementation framework
2-5 Conduct training for trainers
2-6 Prepare training guidelines, curriculum, schedule, and texts
2-7 Prepare necessary training equipment
2-8 Implement training program
2-9 Reflect lessons gained from evaluations in revised program
2-10 Prepare future training program including necessary budget after project completion
2-11 Disseminate knowledge about renewable energy O&M and appropriate planning methods among relevant personnel

Target Country: Kiribati, Tuvalu, Micronesia, and Marshall

Overall Goal
To improve energy security and reduce greenhouse gases through reduced consumption of fossil fuels.

Project Goal
To introduce hybrid power generation systems.

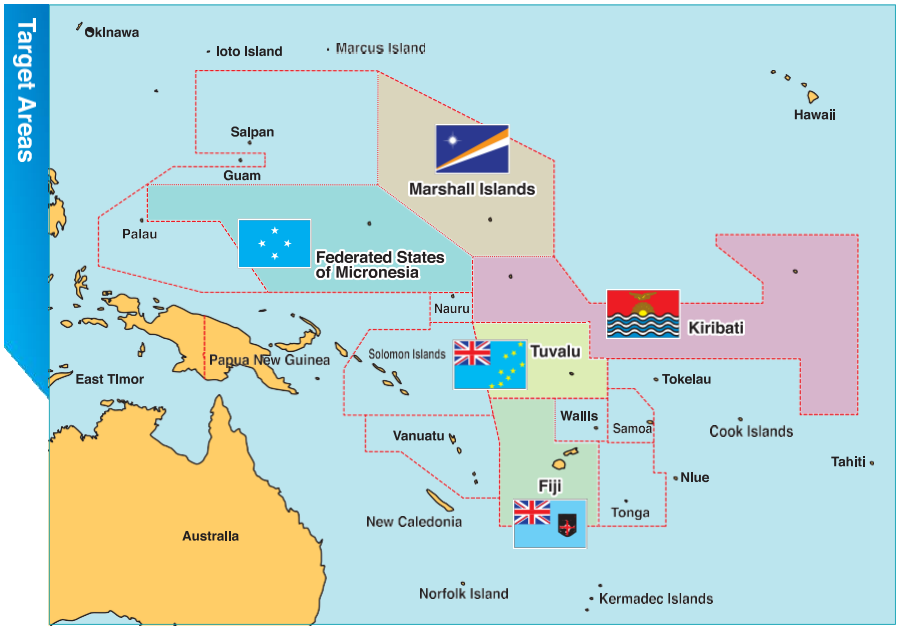
Project Activities

Output 1 Enhancement of an appropriate and economical system for implementing DG O&M

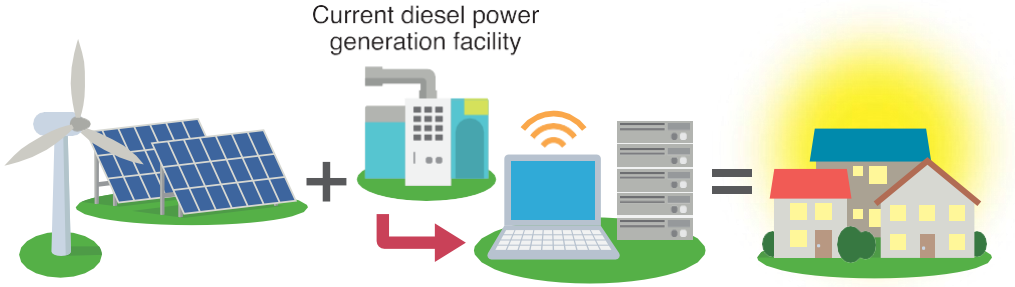
1-1 Verify current DG operational status
1-2 Measure DG fuel consumption rate
Prepare DG asset management plan (only for Kiribati)
1-3 Prepare DG operation improvement plan
1-4 Verify current DG spare parts and maintenance tools
1-5 Implement DG operation improvement plan
1-6 Verify results of implemented improvement plan and update improvement plan
1-7 Share EDC concepts and apply where feasible
1-8 Arrange for current DG spare parts and maintenance tools
1-9 Prepare DG maintenance schedule
1-10 Prepare DG maintenance checklist and manual
1-11 Implement DG maintenance work according to schedule
1-12 Prepare future maintenance schedule and budget
1-13 Measure DG fuel consumption rate before and after activities implemented
1-14 Regularly conduct training relevant on appropriate DG O&M implementation system
1-15 Disseminate knowledge about appropriate O&M among relevant personnel

Output 2 Establishment of appropriate renewable energy power generation plan and O&M methods

2-1 Verify current status of renewable energy power generation and introduction plan
2-2 Prepare planning manual for hybrid power generation systems
2-3 Verify results of manual application and update content
2-4 Verify operational status of current renewable energy power generation facilities
2-5 Prepare O&M manual
2-6 Implement O&M in accordance with O&M manual
2-7 Prepare future O&M business plan and budget
2-8 Implement training program for hybrid power generation systems
2-9 Disseminate knowledge about hybrid power generation systems among relevant personnel



What is Hybrid Power Generation System?



Stable supply of electric power acheived through hybrid operation of existing diesel and renewable energy power generation facilities

The future aim is to achieve 100% renewable energy through combination of renewable energy and storage batteries

Project Description

Implementation of training program by trainers in Fiji

Engineers in target countries other than Fiji have been invited to Fiji where training has been provided in diesel generators (DG) and renewable energy operation and maintenance (O&M).With the support of Japanese experts, trainers in Fiji have provided classroom instruction and practical training to participants from each country. Trainers have also gained experience in giving presentations during area training and worked hard to improve their competency as instructors.

Training in DG and renewable energy O&M

Training has been regularly conducted in O&M skills and maintenance that uses checklists to service DGs and renewable energy facilities on-site. Manuals have also been jointly prepared so that personnel may continue to implement appropriate O&M.In addition, facility managers and maintenance personnel have been invited to Okinawa and shown how hybrid power generation systems operate in Japan's island areas. They have learned about grid stabilization technique, experienced DG overhauls, and made use of this knowledge for operating facilities in their own countries.

Online training

During this time when travel is not feasible, training has been provided via remote conferencing system linked to the target countries so that opinions may be exchanged, consultations held, and other discussions engaged in. Assistance has been maintained thanks to much greater communication made possible by remote support.

System analysis simulation of Samoa and review of grid stabilization measures

Samoa has set a goal of achieving 100% renewable energy by the year 2025 In considering how to achieve this, system analysis simulations have been conducted assuming renewables supply 100% of the electric power in order to identify issues to be addressed and examine necessary measures. This knowledge has been shared with the other countries participating in this project.Although Samoa is not one of the target countries, the results of this case study in increasing the amount of renewable energy adopted will serve as a reference for target countries in planning for their own future adoption of renewable energy.

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